

Docket No.: YHK-0119

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCE**

In re Application of

Confirmation No.: 9669

Hyun Mok YU and Joong Seo PARK

Group Art Unit: 2629

Serial No.: 10/662,406

Examiner: Sherman, Stephen G.

Filed: September 16, 2003

Customer No.: 34610

For: METHOD AND APPARATUS FOR DRIVING PLASMA DISPLAY PANEL

REPLY BRIEF

U.S. Patent and Trademark Office
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Sir:

This Reply Brief is being filed within two months of the date of the Examiner's Answer, and therefore no extensions of time are necessary.

ARGUMENT

Appellants submit that the reasons set forth in the Examiner's Answer in support of the outstanding rejections are improper for the following reasons.

I. Claims 5, 6, 14, 15, 21, 22, 28, and 29 are Not Anticipated by the Tajima Patent

In the Examiner's Answer, the Examiner emphasized that the gray-scale level adjustment means shown in Figure 1 is not being relied on to reject the claims, but rather the gray-scale level adjustment means shown in Figure 3. More specifically, the Examiner contends that the Figure 3 embodiment of Tajima includes the following features in claim 5:

- 1) "a gray level detector for the detecting a gray level distribution of a data," and
- 2) "an adjuster for adjusting at least one of the number of sustaining pulses or a subfield arrangement in accordance with a gray level distribution of said data."

Appellants respectfully disagree.

Figure 3 identifies a gray-scale level adjustment means using the same reference numeral, and the gray-scale level adjustment means in Figure 1. However, the Tajima patent discloses, at column 26, that means 75 in Figure 3 is different in some respects to means 75 in Figure 1. While there are some differences, means 75 in Figures 1 and 3 are the same in that they neither performs the function of the "adjuster" recited in claim 5. Moreover, both of the Figure 1 and Figure 3 embodiments of Tajima omit the gray level detector recited in this claim.

As disclosed at column 26, the gray-scale level adjustment means shown in Figure 3 arranges a sequence of sub-frames for displaying the data of one frame. This is accomplished using an intensity data arrangement switching means 101 and a frame counter 79. The sub-frames arranged by these means causes the gray-scale level of the image to be adjusted. (See column 26, lines 17-45).

In order to achieve the invention defined in claim 5, the gray-scale level adjustment means of Figure 3 must receive as an input a “gray level distribution of data” detected by a gray level detector. Without these features, the invention of claim 5 cannot be anticipated.

Figure 3 shows the inputs that the gray-scale level adjustment means relies on to select and arranges sub-frames. These inputs consist of: R7~0, G7~0, B7~0, VSYNC, HSYNC, BLANK, CLOCK, and FQ. The RGB inputs correspond to display data, VSYNC is a vertical synchronization signal, HSYNC is a horizontal synchronization signal, BLANK is a blanking signal, CLOCK is a clock signal, and FQ is the same type of frame selection signal discussed at length in the Appeal Brief. **None of these inputs corresponds to a gray level distribution of data detected by a gray level detector**, as required by claim 5.

Thus, while there may be some differences between means 75 in Figure 1 and means 75 in Figure 3, those means elements are the same in that neither performs the function of the adjuster recited in claim 5.

Moreover, from the Examiner's Answer (see, for example, page 16), it is apparent that the Examiner is confusing a circuit that generates an output that affects a gray-scale level of displayed data such as means 75 of Figure 3, with a circuit that receives as an input a gray level distribution data that is used as a basis for adjusting at least one of the number of sustaining pulses or a subfield arrangement, as is the case with the adjuster of claim 5. They are not the same. Moreover, Figure 3 makes these differences clearly evident because none of the inputs into means 75 corresponds to a gray level distribution of data as detected by a gray level detector.

Appellants further note that the RCA1 signal discussed in the Appeal Brief relative to means 75 is also present in Figure 3, except in Figure 3 the RCA1 signal is an input into display data control section 36. Neither this RCA1 signal nor any of the other inputs into control section 36 constitute a gray level distribution of data as detected by a gray level detector.

As far as the existence of the claimed gray level detector is concerned, the Examiner indicated in the Examiner's Answer that means 75 in Figure 3 is being relied on to provide this feature. (See Page 19 of the Examiner's Answer). However, no such detector exists in means 75. As shown in Figure 3, means 75 is formed from intensity data arrangement switching means 101 and frame counter 79. Neither of these features constitutes a gray level detector, and neither does controller 36. Moreover, column 26 of Tajima, which describes means 75 of Figure 3 in detail, makes not such disclosure.

In view of the foregoing considerations, Appellants submit that the Figure 3 embodiment of Tajima fails to include the following features in claim 5: (1) "a gray level detector for the detecting a gray level distribution of a data" and (2) "an adjuster for adjusting at least one of the number of sustaining pulses or a subfield arrangement in accordance with a gray level distribution of said data." Without a disclosure of these features, the Figure 3 embodiment of Tajima cannot anticipate claim 5 or any of its dependent claims.

Claim 6 recites that the "adjuster adjusts both the number of sustaining pulses and a subfield arrangement in accordance with the gray level distribution of said data." (Emphasis added). The Tajima patent does not disclose these features, i.e., Tajima discloses re-arranging the subfields of input data based on the inputs shown in Figure 3 (discussed above). None of these

inputs is indicative of a gray-scale level distribution of data generated from a detector as recited in claim 5. Consequently, Tajima also fails to disclose the features of claim 6.

Claim 14 recites features similar to those which patentable distinguish claim 5 from the Tajima patent, e.g., “detecting a gray level distribution of a data” and “adjusting at least one of the number of sustaining pulses or a sub-field arrangement in accordance with a gray level distribution of said data.” The Tajima patent does not disclose these features. Appellants therefore submit that the Tajima patent cannot be relied on to establish a *prima facie* case of anticipation for claim 14 or any of its dependent claims.

Claim 21 recites that “the number of the sub-fields after said adjustment equals the number of sub-fields before said adjustment for driving the panel.” These features are not taught or suggested by Tajima, i.e., that the number of sub-fields used to display input data is the same both before and after either the number of sustaining pulses is adjusted and/or the sub-field arrangement is adjusted.

Claim 29 recites that “the sub-field arrangements are predetermined to reduce contour noise for different regions having a largest portion of the gray-level distribution.” The Tajima patent does not disclose these features. In rejecting claim 29, the Examiner relied on the disclosure at column 42, lines 53-60, of Tajima. But this portion of Tajima only discloses selecting a sequence of sub-frames having an alternating arrangement of high and low weights. Neither this portion of Tajima nor any other portion discloses sub-field arrangements which are predetermined to reduce contour noise for different regions having a largest portion of the detected gray-level distribution.

II. Claims 7, 8, 16, and 17 are Non-Obvious Over a Tajima-Tanabe Combination

Claim 7 recites that the adjuster “reduces the number of sustaining pulses when gray levels of said data concentrate on a low gray level.” (Emphasis added). The Tanabe publication does not disclose these features.

The Tanabe publication discloses a controller for driving a display panel. The controller includes a gray scale number judging circuit 22 and a driving control circuit 30. The judging circuit 22 counts the number of gray scale levels that exist in the data of one display screen. The driving control circuit then reduces or increases the number of sub-fields used to display that data based on the number of gray scale levels.

Unlike claim 7, regardless of the number of sub-fields that are used, Tanabe maintains the same number of sustaining pulses to display input data. This is clear from a comparison of Figures 8A - 8H, where a total number of sustaining pulses across all sub-fields remains the same regardless of whether eight sub-fields are used (Figure 8A) or whether one sub-field is used (Figure 8H). Appellants therefore submit that the features of claim 7 are not taught or suggested by the Tanabe publication or the Tajima patent, whether taken alone or in combination.

Claim 8 recites that the adjuster increases the number of sustaining pulses when gray levels of the data concentrate on a high gray level. The Tanabe publication does not teach or suggest these features, i.e., Tanabe discloses reducing or increasing the number of sub-fields but not the number of sustaining pulses. Accordingly, Appellants submit that claim 8 is non-obvious over a Tajima-Tanabe combination.

Claim 16 recites reducing the number of sustaining pulses when gray levels of said data

concentrate on a low gray level, and claim 17 recites increasing the number of sustaining pulses when gray levels of said data concentrate on a high gray level. The Tanabe publication does not teach or suggest these features. Accordingly, it is submitted that claims 16 and 17 are non-obvious over a Tajima-Tanabe combination.

III. Claims 19 and 20 are Non-Obvious over Tajima-AAPA Combination

Appellants submit that claims 19 and 20 are not obvious in view of a Tajima-AAPA combination, because AAPA does not teach or suggest the features of base claim 5 missing from the Tajima patent.

IV. Claims 23-27 and 30 are Non-Obvious over Tajima

Claim 23 recites that the adjuster of claim 5 generates a histogram of gray-level values corresponding to the gray-level distribution of said data, the adjuster performing said adjustment based on the histogram. In view of the foregoing discussion in Section I of this paper, the Tajima patent does not teach or suggest the adjuster of base claim 5. It therefore logically follows that Tajima does not teach or suggest the features of claim 23, which further defines functions performed by this adjuster.

Claim 24 recites that the detector divides the gray-level distribution into a plurality of predetermined regions, and that the adjuster compares the gray-level distribution in the regions and adjusts the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison. The Tajima patent does not teach or suggest the detector and adjuster

of base claim 5. It therefore logically follows that Tajima does not teach or suggest the features of claim 24, which further defines functions the detector and adjuster.

That is, Tajima does not teach or suggest a detector which divides a detected gray-level distribution into a plurality of predetermined regions, and an adjuster compares the gray-level distribution in the regions and adjusts the number of sustaining pulses in one or more of the predetermined sub-fields based on the comparison. Absent a teaching or suggestion of these features, the Tajima patent cannot be relied on to establish a *prima facie* case of obviousness of claim 24.

Claim 25 recites that the adjuster performs said comparison to determine a region having largest gray-level distribution and adjusts the number of sustaining pulses in one or more of the sub-fields to produce a corresponding change in brightness of the displayed image. The Tajima patent does not teach or suggest the adjuster of base claim 5. It therefore logically follows that Tajima does not teach or suggest the additional functions of the adjuster recited in claim 25.

Claim 26 recites that the adjuster decreases the number of sustaining pulses to less than a predetermined references value when the largest gray-level distribution is located in a region corresponding to a low range of gray levels. Tajima discloses re-arranging sequences of sub-frames of input data. However, Tajima does not teach or suggest the functions of the adjuster defined in claim 5, nor does not teach or suggest the additional functions of the adjuster as recited in claim 26, including decreasing the number of sustaining pulses to less than a predetermined references value when the largest gray-level distribution is located in a region corresponding to a low range of gray levels.

Claim 27 recites that the adjuster increases the number of sustaining pulses to more than the predetermined reference value when the largest gray-level distribution is located in a region corresponding to a high range of gray levels. The Tajima patent does not teach or suggest these features.

Claim 30 recites different sub-field arrangements for accomplishing the reduction in contour noise for different regions having a largest portion of the gray-level distribution as recited in claim 29. Specifically, these arrangements include:

- a) “in a first arrangement, the number of sustaining pulses in the sub-fields changes in ascending order”
- b) “in a second arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order, the number of sustaining pulses in a second portion of the sub-fields includes a maximum number of sustaining pulses, and the number of sustaining pulses in a third portion of the sub-fields changes in descending order” and
- c) “in a third arrangement, the number of sustaining pulses in a first portion of the sub-fields changes in ascending order and the number of sustaining pulses in a second portion of the sub-fields are set to a same number of sustaining pulses.” (See, for example, Figures 5A-5C of Applicants’ drawings for these sub-field arrangements).

The Tajima patent does not teach or suggest these features. Accordingly, Tajima cannot be relied on to establish a *prima facie* case of obviousness of claim 30.

V. Claims 5 and 14 are Not Indefinite Under 35 USC § 112, Second Paragraph

Claim 5 recites “the number of sustaining pulses.” Appellants submit that the meaning of this phrase is clear in view of the specification. For example, the specification discloses that a frame of data is divided into sub-fields, with each subfield containing a sustain period that contain sustaining pulses. Accordingly, one skilled in the art would understand that the sub-fields and sub-field arrangement recited in claim 5 includes sustaining pulses. Based on this understanding, it is submitted that claim 1 complies with the requirements of § 112, second paragraph.

The same reasoning may be applied for claim 14 in terms of its compliance with § 112, second paragraph.

VI. The Objection of Claim 19

Appellants submit that the inclusion of the period at the end of claim 19 is evident.

For the foregoing reasons, Appellants respectfully request the Board to reverse the rejections in the outstanding Office Action.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Daniel Y. J. Kim', is written over the printed name and registration number.

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